Laugh at a Funeral: Distinct Roles of Valence Congruity and Semantic Congruity in Discourse

INTRODUCTION: Emotional written language can be highly potent, with the potential to impose affective states, orient attention, or alter thoughts and behavior. Yet, we know little about how emotional meaning is integrated into linguistic context. The neural mechanisms engaged in computing semantic congruity, however, are better understood. The N400 event-related potential (ERP) component is attenuated to words that are semantically congruous (vs. incongruous) with their preceding discourse context (Kutas & Hillyard, 1984), reflecting a facilitation of lexico-semantic processing. We asked whether an analogous N400 facilitation would be observed to words that were valence congruous (versus incongruous) with their preceding context.

METHODS: ERPs were measured as 24 participants read two-sentence scenarios with critical words that varied by emotional valence (pleasant, neutral, or unpleasant) and congruence (congruent or incongruent). In each scenario, the first sentence, presented as a whole, established a pleasant, unpleasant, or neutral situation. The second sentence, presented word-by-word, differed at a single critical word (pleasant, unpleasant or neutral) – to which ERPs were time-locked – that was either congruous (1a, 2a, 3a) or incongruous (1b, 2b, 3b) with the preceding context. Congruous critical words were matched on cloze, and all incongruous critical words had zero cloze. All significant effects were repeated in subsets that were matched on concreteness, word length, and frequency.

RESULTS: As expected, a large N400 effect was elicited to neutral, semantically incongruous (vs. congruous) critical words. Surprisingly, however, no such N400 congruity effect was observed for either pleasant or unpleasant valence incongruous (versus congruous) critical words, despite the unpredictability of these words and participants’ post-experimental reports that they found the affectively incongruous sentences surprising. The N400 evoked by both pleasant and unpleasant emotional words was equal to that of the neutral congruous words, regardless of whether they were congruous or incongruous with their context. As in previous studies, a large late positivity effect was evoked by emotional (vs. neutral) words, which was larger to unpleasant than pleasant words. This late positivity was not modulated by affective or semantic congruity.

CONCLUSIONS: These findings suggest that valence congruity and semantic congruity are treated differently by the brain during online discourse processing. The lexico-semantic processing of emotional words – both valent congruous and incongruous – was actually facilitated to the same degree as the lexico-semantic processing of semantically congruous words. We interpret this pattern of results as indicating that emotionally salient contexts facilitate the processing of subsequent emotionally salient language, regardless of valence congruity. In other words, congruity of emotional salience is more important than congruity of emotional valence during written language comprehension. This interpretation is consistent with previous findings that valence-congruous and incongruous noun phrases (such as “dead tyrant” and “dead puppy”) are processed similarly (Fischler & Bradley, 2006). In addition, it can also explain why previous sentence-level work identified an N400 effect when introducing emotional words (vs. neutral words) in neutral contexts (Holt, Lynn, & Kuperberg, 2009). Implications for past and future research are discussed.
Examples:

1 – Pleasant:

a) Peggy smiled as she walked into the basement. Something in that room was emanating a **wonderful** smell.

b) Peggy gagged as she walked into the basement. Something in that room was emanating a **wonderful** smell.

2 – Unpleasant:

a) Peggy gagged as she walked into the basement. Something in that room was emanating a **foul** smell.

b) Peggy smiled as she walked into the basement. Something in that room was emanating a **foul** smell.

3 – Neutral:

a) Peggy sneezed as she walked into the basement. Something in that room was emanating a **peppery** smell.

b) Peggy sneezed as she walked into the basement. Something in that room was emanating a **fruity** smell.

References

